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ABSTRACT

The Production Control Training Program is a competency-based management training program currently in operation at the Defense Systems Division of Honeywell, Incorporated. Designed with the needs of the adult learner in mind, the program involves pretests and meetings between supervisors and individual staff members to identify individualized training profiles. This assessment process has resulted in a program of workshops that is responsive to trainees' individual training needs, schedule constraints, and learning styles. As a result of the training program, the following improvements have been noted: paper work reductions, reductions in over-ordered material, improved record accuracy, and improved scheduling. These results have been achieved with a training program that costs 30 to 40 percent less than would a more traditional program. (MN)

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MANUFACTURING MANAGEMENT SYSTEMS -- USER TRAINING:

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ABSTRACT:

This presentation will discuss the Production Control Training Program in place at DSD's Minneapolis locations. Specifically, the presentation will address:

- How we have developed and integrated competency based training into a fast paced work environment.
- The results we have achieved.

Training is an investment that Honeywell makes in its people and like any other investment, Honeywell expects a positive return on that investment. We have designed our Production Control Training Program to achieve a maximum return on the investment. To do this, we paid careful attention to the characteristics of adult learners. This has resulted in a program that violates some of the traditional rules about training.

Development and implementation of the training program is a three-step process. First, classes were developed using a straightforward five-step methodology. Second, a pretest was given to help people identify what training they needed. Third, supervisors met separately with each of their staff members to identify individualized training profiles. This process resulted in a program that meets the trainees':

- Training needs,
- Schedule constraints,
- Learning styles.

The design of the training program has contributed significantly to the results we have achieved. We have seen significant operating improvements in terms of:

- Paper work reductions,
- Reductions in over ordered material,
- Improved record accuracy,
- Improved scheduling.

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These results have been achieved with a training program that costs 30 to 40% less than the cost of a more traditional program.

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INTRO

Good (morning/afternoon), my name is Chuck Hunt. For the last year and a half, I have been responsible for developing training and education programs to ensure "optimal" utilization of DSD's Production Operating System by our Production Department. I'd like to make it clear right up front that I'm not a training professional. I may use terms somewhat differently than most of you do. If there's something that I'm not clear about, please, just stop me and we'll get your question cleaned up. For that matter if you have any questions along the way I'll be happy to answer them.

Today I'll be describing the training program we have in place for our Production Control personnel. I'll be paying particular attention to how we have integrated competency-based training into a fast-paced work environment.

Next, I'll review how we evaluate the effectiveness of the training program, and the results we have achieved.

Finally, I'll describe how we use an Apple micro computer to keep training records. The records are used to generate status reports to employees and their supervisors. These reports play an important role in the training program.

Before we go any further, I'd like to give some background about:

- Why we developed our training program
- Who we are training
- What we are training people to use
- The environment in which we conduct the training.

BACKGROUND

Honeywell is committed to providing its personnel with the best, most cost effective tools available. This is true for all areas. Honeywell is just as concerned about the tools available to our Procurement Department as it is about the tools our production operators use to build our products. Currently, the Avionics and Defense Group is in the process of developing a new Production Operating System that will take advantage of the capabilities of Honeywell's DPS-8 mainframe computers networked with distributed DPS-6 mini computers. This new Production Operating System will provide Marketing, Engineering, Procurement, Finance, Production, and Management with substantially improved tools.

These new tools will represent a massive investment in hardware and software. However, if this investment is going to pay off, one last piece of the puzzle must be put in place - "peopleware". Peopleware is made up of a number of elements.

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- Program Management: This covers all the planning and coordination that must go into the development and implementation of a new computer system.

- Change Management: This goes hand in hand with program management except it is more concerned with "soft" issues such as political concerns and the anxiety that many people have about any new system.

- Attitude/Knowledge/Skills: These are the three elements of peopleware that our training program covers.

- Application: This is what it is all about: getting people to use the system. From a peopleware standpoint this also includes how you ensure that people continue to use the system more and more effectively.

I've been talking about peopleware in the context of implementing a new system it is just as important and applicable when addressing the question: how do we improve our use of our current system.

Management at DSD recognized from the very beginning that training and education would play a key role in ensuring effective implementation. Our training and education program serves a number of functions:

- Change Implementation: Basically we train to change people's behavior. Before I go any further I should clarify what I mean by changing people's behavior. We are not playing B. F. Skinner. We are not being manipulative. We are trying to ensure that people use the tools available to the best of their ability. This is a very simple concept. For example if five months ago some people had been throwing reports in the trash we would try to make sure that they stopped doing that and starting using those reports to make better, more timely decisions. This raises the difference between training in all kinds of schools (High Schools, Vo-Techs, Universities, etc.) and "industry". Training and education in schools is by and large an investment by society and the individual student in increased productivity. Training and education in industry on the other hand is an investment by the firm in increased productivity and the firm rightly demands a specific return on that investment. The goals are very similar in both cases however the measurement of effectiveness or worth of the training are quite different.

- Improved Productivity and Effectiveness: In the short term, the training is intended to help people better understand the tools that are presently available and to improve their on-the-job application of those tools.

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- New System Implementation: In the long term, training is intended to ease the conversion to the new production operating system and ensure its day-to-day application.

The decision to develop a training program now (three years in advance of system implementation) was based on:

- The transportability of basic skills and disciplines from our current system to the new system,
- A commitment by Honeywell's management to increase the utilization of our current system, and
- The desire by Honeywell's management to make training and education an ongoing process that will support continually improved operations and inhanced competitive position.

As I mentioned before, the Avionics and Defense Group is developing enhanced tools for Marketing, Engineering, Procurement, Finance, Production, and Management. My responsibilities focus on training for the Production Department. There are two groups in the Production Department:

- The Factory which includes Production Supervisors, Group Leaders, and Production Operators.
- Production Control, which includes Supervisors, Master Schedulers, Leads whose function is very similar to the Group Leaders in the factory i.e., provide work direction to the Inventory Analysts and Production Coordinators.

My presentation focuses on our production control training program as such I would like to give you a cleaner picture of what Production Control's responsibilities are. Simply put Production Control:

- Schedules production to maximize productivity.
- Manages inventory to maximize return on investment.
- Orders material.
- Coordinates support groups such as Engineering and Receiving Inspection.

In order to ensure the on-time delivery of a quality product at minimum cost.

Both our present and future Production Systems are Manufacturing Resource Planning Systems. Manufacturing Resource Planning or MRP is a standard set of tools that can be used by Production Control to more effectively manage inventory, schedule production, and coordinate support groups. In addition, MRP

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provides the Factory with tools that help the supervisor maximize his or her people's productivity and ability to meet schedule.

MRP consists of:

- A production plan which presents management's goal for shipment of production hardware.
- A master production schedule which details how Production will support the Production Plan. The Master Schedule is stated in terms of quantities of units that will be built and "drives" the balance of the MRP system.
- Material Requirements Planning which uses the Master Production Schedule, the Bill Material and Inventory Records to develop time phased requirements for materials and subassemblies.
- Capacity Requirements Planning which develops detailed Factory build schedules and the capacity necessary to support those schedules.
- An evaluation of whether or not it will be possible to meet the Master Production Schedule. If material or capacity will not be available to support the Master Production Schedule, the Master Production Schedule must be revised to reflect a "Doable" or "Realistic" plan.
- Execution of the Material and Capacity Plans and feedback of results. This feedback ensures that all plans stay "Doable" over time, which makes it possible for virtually everybody in the company to be working for maximum effect.

The Production Operating System presently in use at DSD is the Government and Aeronautical Products Operating System, or GAPOS for short. Training on GAPOS focuses on the forms and reports that Production Control must use on a day-to-day basis.

Before I go on I would like to digress and touch on how we approach training administrative personnel. We believe that training should focus on:

- The use of tools.
- The relationships between tools. This is especially important with computer systems in which many tools are directly or indirectly linked together.
- Special objective skills such as scheduling or programming in BASIC.

In other words how to get the job done. I don't want to leave you with the impression that Honeywell doesn't address people's

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needs for more general education. Honeywell has an active After Hours Continuing Education Program (ACE) which includes classes ranging from Self Defense to Basic Electronics to Listening Skills. Further more Honeywell has a number of Human Resource Develoment Departments which offer workshops such as Time Management and Career Exploration.

There is increasing coordination between all of Honeywell's "training" and "education" departments. This coordination helps to ensure that people receive the training and education they need to help them be as productive and effective as they can be.

Getting back to the Production Control training program, we train people to use tools such as the coordinator planner. In class we would cover how to read the report and how to use the report to make better decisions and get results on the job.

We also deal with how our system works. For example we make sure that people understand the mechanics of material requirements planning. Ultimately we want our system to be "transparent" to the people who use it. This transparency ensures that people understand where the numbers on the reports come from.

As I mentioned before, Production Control is responsible to schedule and coordinate the activities of most departments to ensure on-time shipment. Needless to say, these are busy people. By necessity, training is not the top priority for these people. The Production Control training program had to take this demanding work environment into consideration.

CURRENT PROGRAM

Production Control personnel have a big say in the makeup of their training program. They are represented by the "Production Control Training Advisory Committee". The Committee is made up of Production Control Supervisors and staff members and is responsible for setting guidelines and approving courses. The Committee has made an important contribution to the success of the program. For example, it has established scheduling and attendance guidelines, initiated the development of several new courses, and helped to forge links with other training programs. However, most importantly, it has fostered a sense of ownership among the Production Control staff members. This ownership has increased the acceptance and effectiveness of the program.

We have developed a competency-based training program. The program is centered on 12 two hour workshops that relate to critical job skills. The 12 workshops were developed by a three member task team. The team used a five step process that ensured comprehensive coverage of important skills and greatly simplified writing the workshops.

- First, the team listed major tasks. For example: Updating Master Production Schedules; pulling parts from stock; and using the coordinator planner.

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- Second, the team developed specific behaviorial objectives for each task. For example, be able to request parts from stock using the SU91 transaction.

- Third, the team reviewed the objectives and tasks with each Production Control Supervisor and obtained written acceptance and approval of the list.

- Fourth, the team grouped the tasks into workshops.

- Fifth, the team wrote the workshops to cover the objectives.

From our standpoint at DSD this approach had two major advantages.

- It helped ensure that our training program was comprehensive - that we covered what was important.

- It cut development costs by making it easier to write the workshops and by minimizing rewrites.

To help people identify what workshops they should consider attending, the Advisory Committee decided to use a pretest. The decision was based on three factors:

- First, we wanted to give people an objective look at their abilities.

- Second, we wanted to convince people of the need for training.

- Third, we wanted to highlight the extent of Production Control's training needs - both to ourselves and to management.

Our first two considerations went hand in hand. We knew that adults are more interested in training that they feel they really need. Furthermore we also knew that some people would be reluctant to admit that they needed training. Taken together they seemed to point strongly to some form of test.

Writing the test was simplified by using the objectives developed for the workshops. The hardest part of writing the test was getting it down to a manageable length. The rough draft was about three times as long as we wanted. By eliminating giveaway questions and combining or cutting out very similar questions, we were able to get the test down to a manageable 3 to 4 hours in length.

People were given at least one week's notice that they were scheduled to take the test. At that time, they received sample test questions and test guidelines. The two most important guidelines were:

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- The test is "open book". People were encouraged to bring whatever notes, manuals, etc., they wanted. This was material they had available at their desk and we felt that the test should be as close to a work environment as possible. People were briefed on how to taken an open book test just prior to the test.

- The test is to help you and your supervisor identify which workshops you should take. We went to great lengths to make sure that all Production Control staff and supervisors knew what the test was designed to do.

After tests were taken and graded, the results were loaded into an Apple computer, which was used to generate summary reports for each employee and supervisor. The employee got a copy of his or her own summary along with their test. The supervisor received only the summary reports for his staff members. I met with each supervisor to review how the test results should be used.

The supervisors met separately with each of their staff members to set up individualized training profiles. The test results were used as a starting point for these discussions, however, other factors such as past performance and specific responsibilities were also considered. The end result of this process was an agreement between the employee and supervisor detailing which workshops the employee would attend and which were optional. In effect we don't have a training program we have 90 individualized training programs. About half of the supervisors tied this discussion and agreement into the employee's Performance Communication session.

Employees are responsible for getting to the workshops they need. I publish class schedules periodically. These class schedules are circulated by each supervisor. Employees simply call in which classes they want to take. They are responsible for getting to the classes they sign up for. This approach helps to increase the employee's involvement in the training program and cuts down on the work required to administer the program.

Our workshops blend lecture, discussion, and exercise. This helps to maximize the effectiveness of the program by:

- Holding people's interest.

- Drawing on peer knowledge.

- Allowing people to try out what they have learned.

We have also kept our workshops down to two hours which also helps to hold people's interest.

The 12 core workshops are offered at least once every eight weeks. Offering these short workshops a number of times each year has a number of advantages.

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- People can take workshops they feel they need when they want. This helps ensure that people are interested when they came to class.

- It tends to keep the class size small. This encourages discussion and questions which enhance the class. In fact we will train one on one if someone requests the workshop or if only one person signs up. Although at first glance this seems inefficient we feel that it helps us maximize our return. We see no point in withholding training from someone who can use the material simply because nine other people are not asking for it at the same time.

- People can fit the workshops into their schedule more easily. Keep in mind that Production Control is one of the fastest paced jobs at Honeywell. For our program to be successful it had to fit in with the "students" schedules not the other way around.

- It helps to minimize the cost of the training program by getting people the workshops they can really use.

In addition to the 12 core workshops, 2 additional classes have been developed in response to requests from Production Control.

- Basic Apple Programming - This is offered as an independent study program followed by a project to make sure the employee can actually apply the Apple computer to his or her job. The course is also offered with classroom work in place of the independent study, if the supervisor and employee feel this would be more effective.

- Production Scheduling - This workshop helps people sharpen their scheduling skills. The class is designed to cover specific scheduling techniques, such as the use of queue to prevent production shutdowns.

These special classes allow us to adapt to and meet the changing needs of Production Control without losing sight of their basic training requirements.

Before I turn to the topic of results I'd like to review how our program stacks up against what we know about adult learning.

- Adults prefer classes that help then cope with changes. Our program was initiated in response to anticipated changes. In the short term we train people to use tools that help them respond effectively to the new demands their supervisors are placing on them. In the long term our program is helping people prepare for our new system by helping them acquire transferable skills and by making them aware of how our new system will differ from our present system.

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- Adults prefer classes that focus on application and have a "how to" approach. We take time to discuss not only how to read the reports but also how to use them on the job. Beyond that we talk about real problems that make it hard to apply the tools and real solutions to those problems.

- Adults prefer classes that avoid long periods of sitting and long lectures. Our program keeps it's classes to just two hours each (breaks are given if they are needed). We use a mix of lecture, discussion, and exercise which keeps the class moving.

- Adults prefer classes that let them try things out. Whenever possible we have people use sample reports to answer questions in class. This really helps people clear up misconceptions because they get immediate feedback.

- Adults prefer classes that encourage discussion with peers. As I have already mentioned discussion is an integral part of our workshops.

- Adults prefer classes that reduce the risk of failing in front of their peers. By keeping class size down and by cultivating an open relaxed atmosphere in class we have been able to lower the risk associated with failing to the point that people are willing to ask questions, and make mistakes.

- Adults also benefit from supervisor involvement before and after class.

I've already described how the Production Control Supervisors were involved in creating individual training programs with their people. We have also trained our supervisors how to maximize the return on their training investment using a "pre up" and follow up technique. In a few minutes I'll discuss how our record keeping system increases supervisory involvement too.

RESULTS

I'd like to turn to the question of results, because that's what it really comes down to - results.

We have three indications of the success of the program.

- Employee feedback
- Supervisory feedback
- Improvement in key operating measures.

All three of these indicate that the training program is helping to improve the effectiveness and productivity of Production Control. Employees claim that they are better able to do their

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jobs. Supervisors claim that these people are better able to do their jobs. Admittedly, these are to a large extent, subjective measures. In fact, by themselves I might not put much credance in them. However, these claims are borne out by some rather objective means. In five months we have achieved substantial operating improvements. For example:

- The computer-generated exceptions flowing across our inventory analysts' desks has been reduced to 65% of their former level and those repeating more than two weeks are down to 55% of their December levels.

- Inventory record accuracy has increased from 83% to 87%.

- Negative balance exception messages have been reduced by 50% and repeaters have been reduced by 90%. The number of negative balances is a key indicator of improving inventory accuracy.

- Potential parts shortages have been cut by almost 20%.

I could go on we have had improvements in master scheduling and even increased direct labor productivity due to improved scheduling and parts availability. The fact is that people are doing a better, more effective, more productive job. Obviously, these results are not due solely to the training program. Achieving this kind of improvement is the result of a number of factors:

- Clear management commitment to improved operations
- Improved policies and procedures
- Increased follow up by supervisors ... and
- Training

The Production Control training program is a key building block in achieving these results.

RECORD KEEPING

Those of you who have had to keep track of training records know how big a job it is. We use an Apple micro computer to store Production Control's training records. This approach has several significant advantages over manual records:

- It allows us to generate class lists, individual training profiles, and supervisory status reports much faster than is possible with a manual system.

- It allows us to answer special questions like, "I'd like to find out the people in George Nelson's group that have taken fewer than 5 classes in the last 6 months". This question could be answered with a manual system, but we can answer it in minutes instead of hours.

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We use the capabilities of the Apple to give our supervisors quarterly status reports that detail what training their people have taken or are planning to take. This is an important part of the training program. Our supervisors use these reports as a basis for ongoing discussions with their staff about training. These ongoing discussions aid the training program in three important ways:

- First, it shows people that their supervisor is interested in training and wants positive results.
- Second, it shows people that their supervisor is concerned about their development.
- Third, it allows the supervisor to follow up and make sure that his or her staff is getting the training they need.

In a nutshell, the Apple allows us to sort and organize the training data far more effectively than we could with a manual system. In fact without the Apple it would be very difficult to give our supervisors the reports that play such a key role in our training program.

SUMMARY

To rap up, we have implemented a training program that is both results effective and cost effective.

We have been able to achieve this because:

- The program is tailored to individual needs. This tailoring also fits well with the people's work environment and ties in well with how adults approach training.
- The program is compantancy based. This ensures that the training gets right to the point.
- The program is user directed. This means that there is much greater ownership and acceptance of the program, which inturn, increases the effectiveness of the training.
- There are regular discussions about training between the supervisors and their employees.
- Finally, the training is an integrated part of a Divisional Program to improve productivity.

For the last four years our management has sponsored a Winning Edge Program. This year the theme is "Excellence in Quality". At Defense Systems Division this means quality products, quality decisions and we believe a quality training program.

Are there any questions?

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